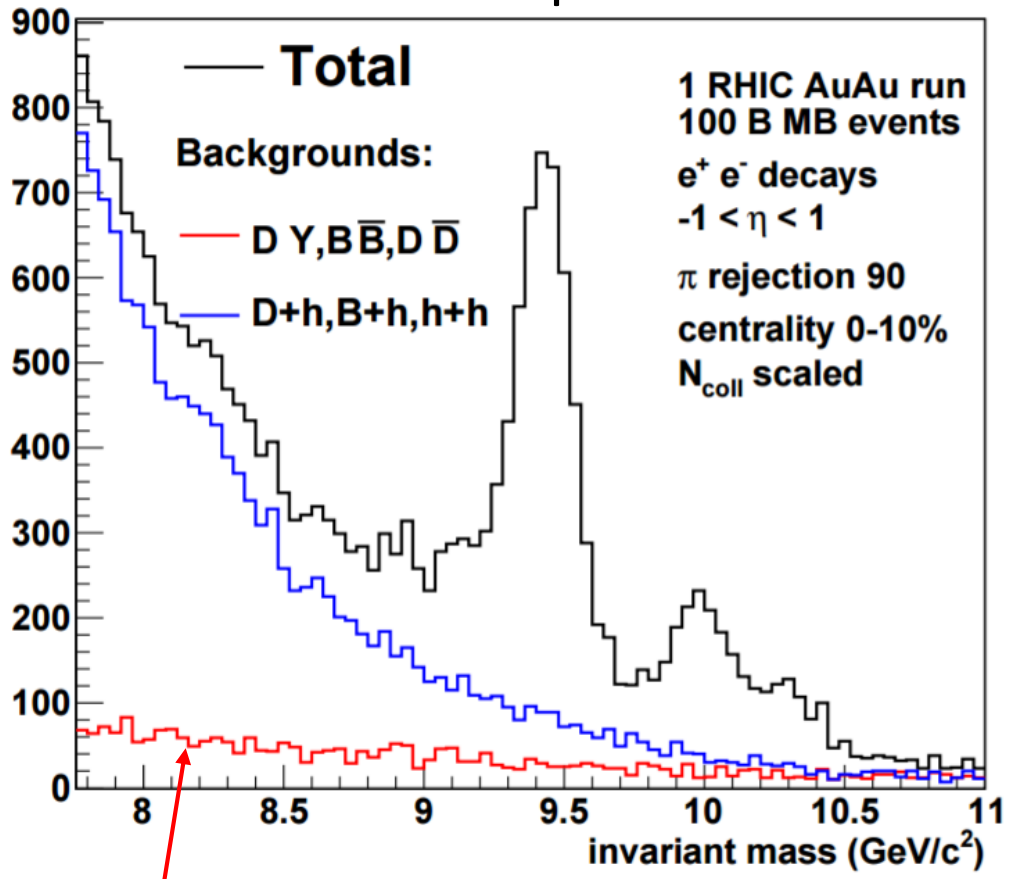
Upsilon R_{AA} update

Sasha Lebedev (ISU)

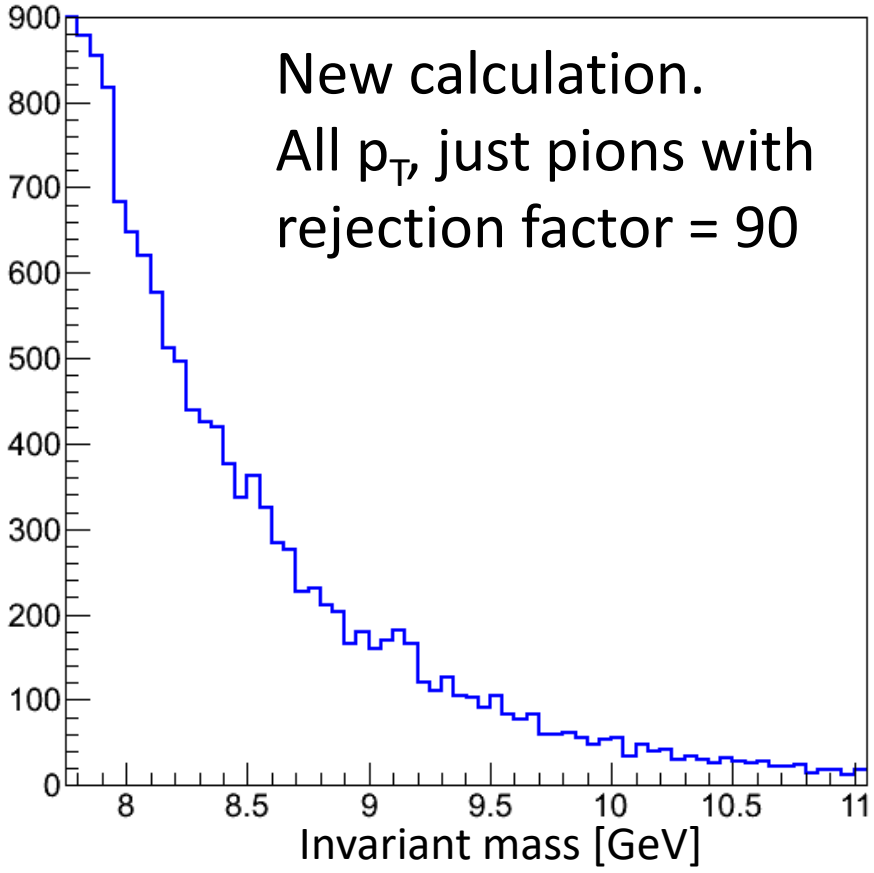
New background binned in p_T turned out to be much larger than what was shown in sPHENIX proposal for all p_T.
Go back to constant pion rejection factor = 90 and compare.

Background integrated over p_T

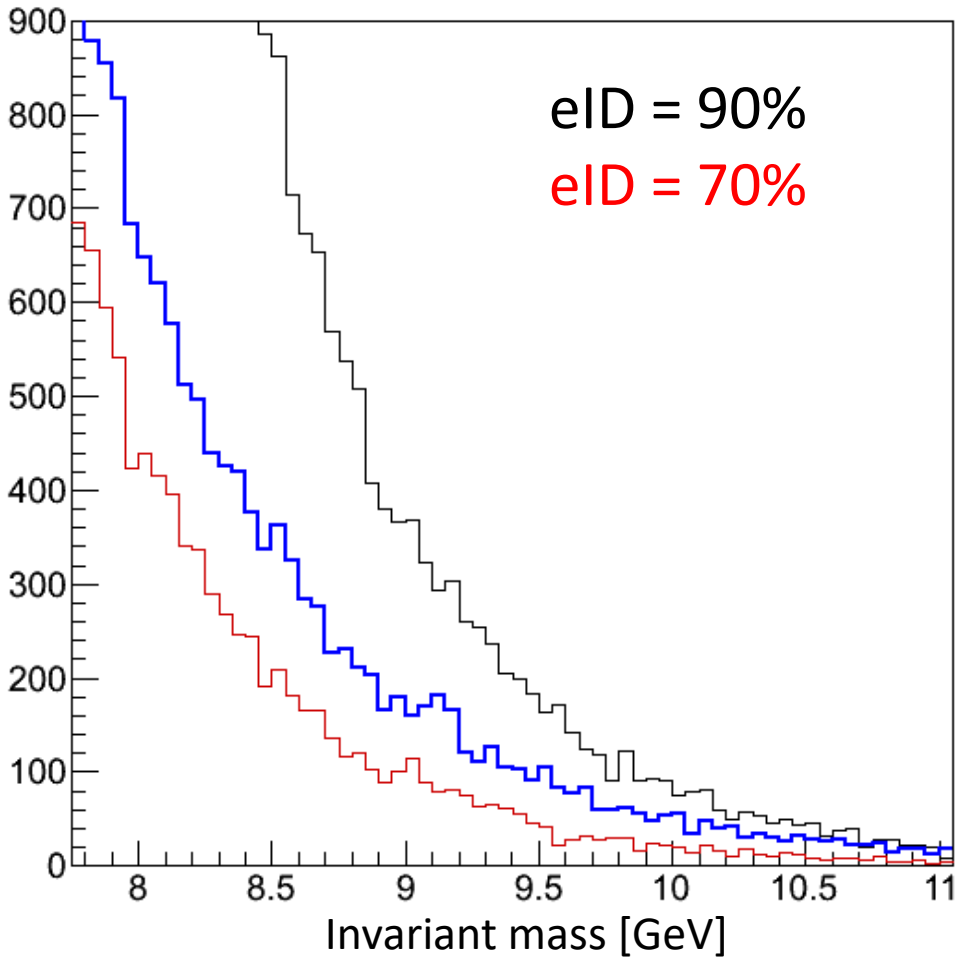
sPHENIX Proposal



correlated background not shown today

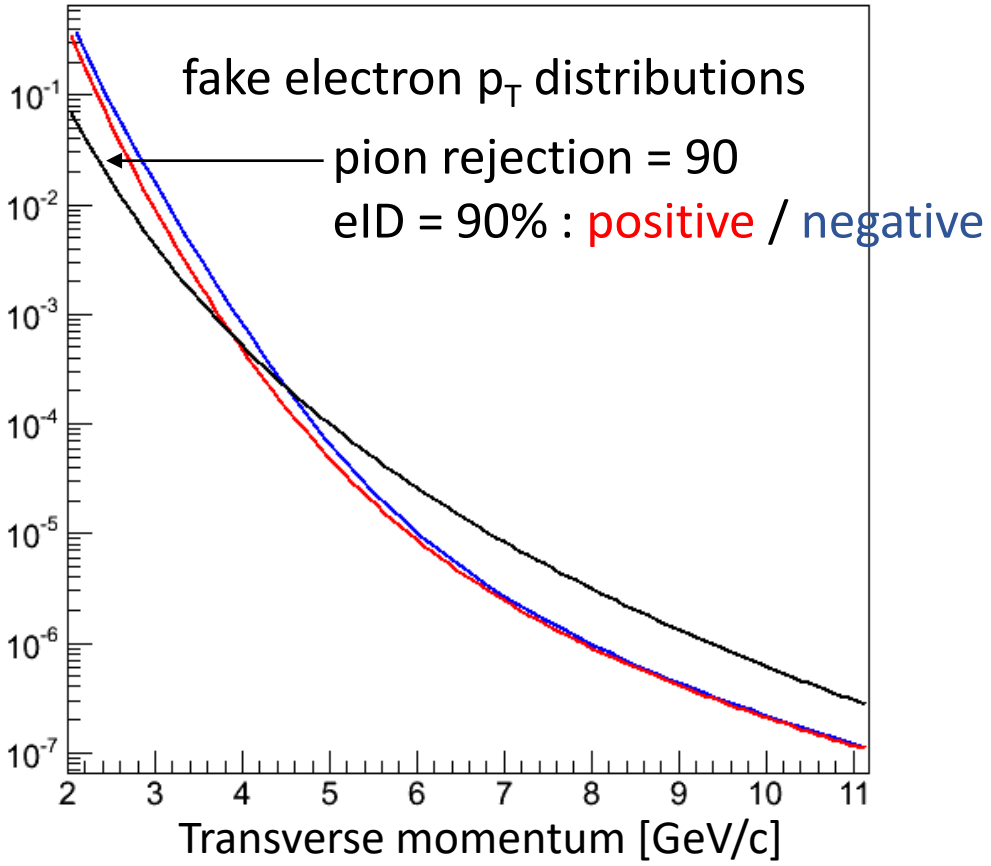


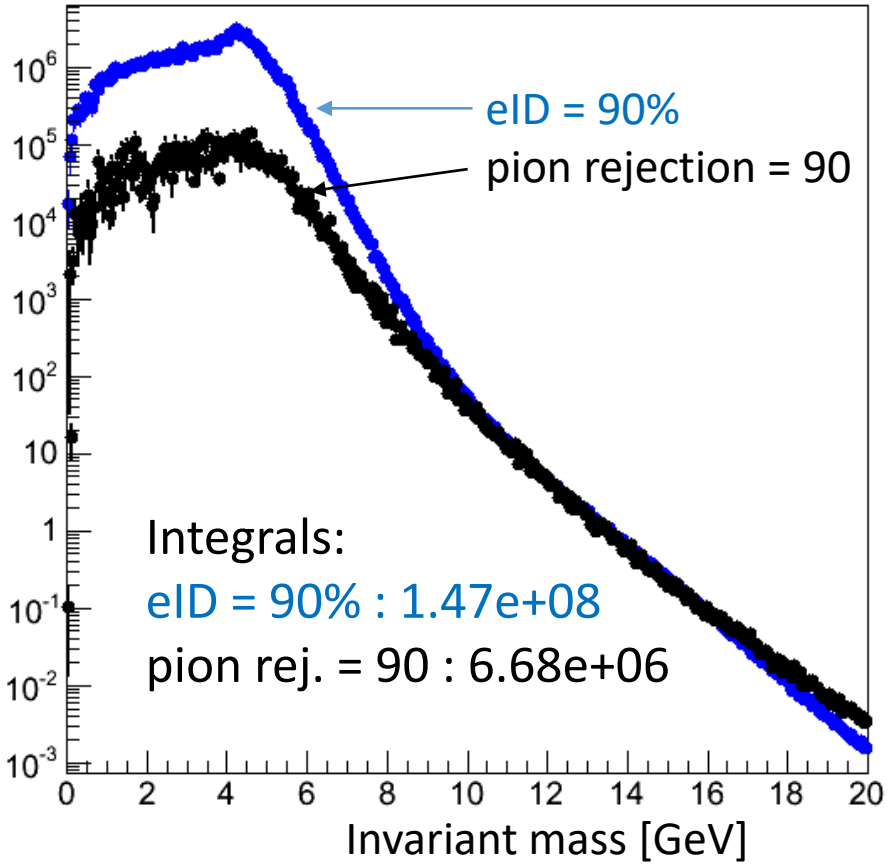
What happens for realistic rejection and other particles included?



Why background is so large for eID = 90%?

eID = 90% mean multiplicity above 2 GeV/c : positive = 0.102; negative = 0.144
pion rejection = 90 : mean multiplicity = 0.026 (about 5 times less)





Integrated over p_T distributions look reasonable.

Error in histogram normalization for p_T bins

Parts turn out to be larger than the whole.

To get good statistics at high invariant mass, we generate events with flat p_T distributions, and use weight to imitate p_T spectra.

The histogram is then normalized by the number of entries in a histogram filled with unit weight but correct p_T distribution (this histogram does not have enough statistics at high mass).

There was an error in this normalization in case of p_T binning.

Will re-calculate R_{AA} and show at the next week's meeting.

Backups

What's different now from the proposal?

- Correct hadron rejection factors now
  - *rejection better at high p_T, but worse at low p_T*
- Includes anti-protons (and protons and kaons)
  - *anti-protons are the main source of fake electrons below ~4.5 GeV*
- Background is now calculated vs. p_T (was integrated over all p_T)
- 0.9 eID efficiency in AuAu (was 0.7)
  - *in p+p eID efficiency 0.9 in both cases*
- Direct Upsilon counting now vs. Crystal Ball fit (?)
  Direct counting in mass range: 9.10 - 9.60; 9.85 - 10.20; 10.25 -10.45 GeV
  - *accuracy of the measurement could probably be improved by using fit*

Zoom in on invariant mass distribution